

WHAT IS CLAIMED IS:

1. An image displaying apparatus comprising:
 - a first plate including at least an electron beam source;
 - 5 a second plate including an anode to which an electric potential for accelerating an electron beam from the electron beam source is applied, and a potential regulating electrode to which a predetermined electric potential lower than that of the anode is applied, the potential regulating electrode being situated at an outside of the anode; and
 - a spacing member provided between said first and second plates, said spacing member contacting both of the anode and the potential regulating electrode, said spacing member including an electrode contacting or being disposed close to the potential regulating electrode thereby electrically connected with the potential regulating electrode.
- 20 2. An image displaying apparatus according to claim 1, wherein said spacing member further includes an electrode contacting or being disposed close to the anode thereby electrically connected with the anode.
- 25 3. An image displaying apparatus according to claim 1, wherein said spacing member further includes an electrode contacting or being disposed close to the

electrode disposed on said first plate side to be electrically connected with the electrode.

4. An image displaying apparatus according to
5 claim 1, wherein an earth potential is supplied to the potential regulating electrode.

5. An image displaying apparatus according to
claim 1, wherein an electric potential equal to a
10 lowest electric potential among electric potentials supplied to the electron beam source or more.

6. An image displaying apparatus according to
claim 1, wherein:

15 the anode include an image area in which a phosphor emitting light by being irradiated with electrons from the electron beam source; and when an averaged height of a portion of the anode contacting the spacing member on an outside of the
20 image area is indicated by Da, and a surface roughness of the portion is indicated by Ra, and an averaged height of a portion of the potential regulating electrode contacting the spacing member is indicated by Db, and a surface roughness of the portion is indicated by Rb, the averaged heights Da and Db and the surface roughnesses Ra and Rb meet following conditions:
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$$|Da - Db| \leq 2Ra, \text{ and } |Da - Db| \leq 2Rb.$$

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7. An image displaying apparatus according to
claim 1, wherein at least an area of said second plate
between the anode and the potential regulating
electrode has a sheet resistance within a range of 10^7
5 (Ω/\square) to 10^{14} (Ω/\square).

8. An image displaying apparatus according to
claim 1, wherein a high resistance membrane is formed
at least in an area of said second plate between the
10 anode and the potential regulating electrode.

9. An image displaying apparatus according to
claim 1, wherein an area having a sheet resistance
within a range of 10^7 (Ω/\square) to 10^{14} (Ω/\square) exists on the
15 spacing member at least between a portion thereof
contacting the anode and a portion thereof contacting
the potential regulating electrode.

10. An image displaying apparatus according to
20 claim 1, wherein a high resistance membrane is formed
on the spacing member at least between a portion
thereof contacting the anode and a portion thereof
contacting the potential regulating electrode.

25 11. An image displaying apparatus according to
claim 1, wherein:
 the spacing member includes an electrode

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contacting or being disposed close to the anode thereby electrically coupled with the anode and an electrode contacting or being disposed close to the potential regulating electrode thereby electrically connected

5 with the potential regulating electrode; and

an area between the electrode contacting or being disposed close to the anode thereby electrically coupled with the anode and the electrode contacting or being disposed close to the potential regulating

10 electrode thereby electrically connected with the potential regulating electrode has a sheet resistance within a range of 10^7 (Ω/\square) to 10^{14} (Ω/\square).

12. An image displaying apparatus according to

15 claim 1, wherein the spacing member includes an electrode contacting or being disposed close to the anode thereby electrically coupled with the anode, an electrode contacting or being disposed close to the potential regulating electrode thereby electrically

20 connected with the potential regulating electrode and a high resistance membrane contacting or being disposed close to each of the electrode contacting or being disposed close to the anode thereby electrically coupled with the anode and the electrode contacting or

25 being disposed close to the potential regulating electrode thereby electrically connected with the potential regulating electrode thereby electrically

connected with them.

13. An image displaying apparatus according to
claim 1, wherein:

5 the spacing member includes an electrode
contacting or being disposed close to the anode thereby
electrically coupled with the anode and an electrode
contacting or being disposed close to the potential
regulating electrode thereby electrically connected
10 with the potential regulating electrode; and
 an interval between the electrode contacting or
being disposed close to the anode thereby electrically
coupled with the anode and the electrode contacting or
being disposed close to the potential regulating
15 electrode thereby electrically connected with the
potential regulating electrode is substantially the
same as an interval between the anode and the potential
regulating electrode.

20 14. An image displaying apparatus according to
claim 1, wherein an interval between a projective
position of an extreme point on the anode side of the
potential regulating electrode to the spacing member
and a position of an extreme point on the anode side of
25 an electrode contacting or being disposed close to the
potential regulating electrode of the spacing member
thereby electrically connected with the potential

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regulating electrode is ten percent or less of an interval between the potential regulating electrode and the anode.

5 15. An image displaying apparatus according to claim 1, wherein:

the spacing member includes an electrode contacting or being disposed close to the anode thereby electrically connected with the anode; and

10 an interval between a projective position of an extreme point on the potential regulating electrode side of the anode to the spacing member and a position of an extreme point on the potential regulating electrode side of the electrode of the spacing member,
15 the electrode contacting or being disposed close to the anode thereby electrically connected with the anode, is ten percent or less of an interval between the potential regulating electrode and the anode.

20 16. An image displaying apparatus according to claim 1, wherein at least a part of said second plate and the spacing member contacts between the potential regulating electrode and the anode of said second plate.

25 17. An image displaying apparatus according to claim 1, wherein a structure contacting the spacing member is provided in an area between the anode and the

potential regulating electrode of said second plate.

18. An image displaying apparatus according to
claim 17, wherein, when an averaged height of said
5 structure contacting the spacing member of said second
plate is indicated by D_c , and an averaged height of a
portion of the anode contacting the spacing member is
indicated by D_a , and a surface roughness of the portion
is indicated by R_a , and an averaged height of a portion
10 of the potential regulating electrode contacting the
spacing member is indicated by D_b , and a surface
roughness of the portion is indicated by R_b , the
averaged heights D_c , D_a and D_b and the surface
roughnesses R_a and R_b meet at least one of following
15 formulae:

$$|D_a - D_c| \leq 2R_a, |D_b - D_c| \leq 2R_b.$$

19. An image displaying apparatus according to
claim 17, wherein said structure contacting the spacing
20 member of said second plate is composed of a high
resistance material.

20. An image displaying apparatus according to
claim 17, wherein a high resistance membrane having a
25 volume resistivity lower than that of said structure is
formed on a surface of said structure contacting the
spacing member of said second plate.

21. An image displaying apparatus according to
claim 1, wherein the spacing member has a structure for
contacting an area between the anode and the potential
regulating electrode of said second plate.

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22. An image displaying apparatus according to
claim 21, wherein said structure of the spacing member
for contacting the area between the anode and the
potential regulating electrode of said second plate is
10 a projecting configuration.

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23. An image displaying apparatus according to
claim 1, wherein the spacing member includes a high
resistance membrane.

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24. An image displaying apparatus according to
claim 23, wherein a sheet resistance of the high
resistance membranes of the spacing member is within a
range of 1×10^7 (Ω/\square) to 1×10^{14} (Ω/\square).

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25. An image displaying apparatus according to
claim 1, wherein the electron beam source provided on
said first plate is disposed in a matrix.

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26. An image displaying apparatus according to
claim 1, wherein the electron beam source is composed
of surface conduction electron-emitting devices.